Reliability of a Weightlifting Accelerometer During Repeated 1 KG Drop Trials

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PURPOSE: The purpose of this study was to examine the reliability of the Tendo™ Sports Weightlifting Analyzer during 1kg-mass drops. **METHODS:** In order to collect data while limiting human error associated with exercise, two separate mechanical drop systems were created for a 1kg-mass to undergo free fall. The 1kg-mass was fitted with the Tendo drawstring and dropped from different displacements corresponding to the barbell displacements observed during the bench-press exercise conducted in a related study. A total of 36 different displacements ranging from 0.309m to 0.539m (some of the subject's displacements were identical by chance) were used. Four trials (T1A,T1B;T2A,T2B;T3A,T3B;T4A,T4B) of 1kg-mass drops were performed using a spring-loaded system with the Tendo set upside-down to emulate a free-fall drop protocol. Because of manufacturer specified concerns with the Tendo being placed upside-down, the drops were then repeated using a second drop protocol (i.e. pulley system) for an additional 4 trials, (T1C,T1D;T2C,T2D;T3C,T3D;T4C,T4D) producing a total of 1720 drop repetitions. **RESULTS:** Paired T-Tests show significantly greater ($p \leq 0.05$) peak velocities (m/s) between T1A and T1B, (2.0757±0.08150, 2.0704±0.08075, p=0.013) between T2A and T2B, (2.2217±0.03276, 2.2301±0.03070, p=0.037) and between T3A and T3B, (2.3655±0.07183, 2.3585±0.06519 p=0.043). Between all other pairings of data, no significance was shown. Intraclass correlation coefficients were significant for all repeated trials. **CONCLUSIONS:** Overall, the Tendo weightlifting analyzer was reliable, with differences in peak velocity of 2.9% between Trials A and B; and 1.0% between Trials C and D.